information." There was no evidence of what that information might have been or whether and how it might have been misused.

Mr. McWay also speculated that on one other occasion a Springwich marketing manager might have passed on to its affiliate, Linx, information that a Linx retail customer would be converting to Mr. McWay's independent resale operation. Again, there was no proof that such information was in fact passed on to Linx or even whether the end-user changed its mind about switching resellers. (Tr. 807-08.) The Decision fails to report that Mr. McWay confirmed Springwich's testimony that Springwich had no way of knowing the identity of the resellers' customers and therefore could not target such customers specifically or pass that information along to Linx. (Tr. 79, 825-26.) Mr. McWay also conceded that the conversation with a representative of Springwich which he alleged was thereafter passed on to Linx was a "limited circumstance." (Tr. 825.)

Clearly, these allegations of supposed coercive or sporadic anti-competitive behavior by Springwich are not sufficient to meet the state's burden to show the need for continued rate regulation, which the DPUC effectively acknowledges by indicating that it wishes to further investigate and review whether anti-competitive behavior has in fact occurred. Decision at 27-28. The state does not have the flexibility under the 1993 Budget Act to petition for continued rate regulation based only upon speculative charges of anti-competitive behavior which even the DPUC acknowledges must be further investigated before any actual findings can be made.

The Decision mentions three other claims of the resellers, the OCC, and the Attorney General in support of its Petition to continue rate regulation. First, while acknowledging that Springwich is not required by the Commission to provide equal access for long distance carriers, the Decision nevertheless claims that "Springwich should have provided for interstate equal access in the spirit of competition" and to comply with recent Connecticut legislation promoting intra-state telecommunications competition. Id. at 27. The DPUC does not recite any anti-competitive or discriminatory rate impact from Springwich's decision to carry all interstate long distance calls through its affiliate, SNET America, failing to mention that a 20 percent discount over SNET America's normal rates is made available to all Springwich customers. Further, the Decision is correct that because SNET is a non-Bell operating company, Springwich is exempt from the requirement in the Modification of Final Judgment to offer cellular subscribers equal access to inter-exchange carriers. The Connecticut statute cited by the DPUC obviously does not relate to the provision of interstate telecommunication services, nor could it do so without being preempted. Finally, the DPUC has added Springwich's alleged failure to comport with the "spirit of competition" with respect to equal access to its list of further investigations to be opened in order to make the findings that it was not able to make in the Decision. Id.

Also to be investigated are the volume discounts currently permitted under DPUC-approved tariffs, which the Decision now states create a "great disparity between the rates and charges the independent resellers currently experience for bulk wholesale cellular service when compared to that experienced by cellular carriers' retail affiliates". Id. at 28. The DPUC can hardly complain about the supposed potential anti-competitive effect of the volume discounts contained in its own approved tariffs, which it has repeatedly stated (including as recently as three years ago) are cost-justified and non-discriminatory. There was no evidence before the DPUC that the wholesale carriers applied the volume discounts in a discriminatory manner, or that they prevented independent resellers from benefitting from them.

Mr. McWay testified that his independent reseller operation offers the identical rate for standard retail service as do the carriers' retail affiliates, and has done so for the entire time that it has been doing business in Connecticut. (Tr. 431, 894-95.) Accordingly, there is no evidence that the volume discounts are being used by the carriers' reseller affiliates to take advantage of their larger size by pricing independent competitors out of the market. There simply is no evidence that a retail pricing war is occurring where a five or six percent advantage in wholesale costs might be significant.

The final item that the DPUC mentions under this evidentiary criterion, which it indicates will require further investigation, is Springwich's practice of billing on a per-minute basis rather than in 30-second increments or less "in order to promote CMRS competition in the State." Decision at 28. Again, the DPUC attacks its approved wholesale tariffs for Springwich, which specifically authorize charging for airtime in one-minute increments.[4] Billing in one-minute increments is consistent with the national industry practice and has been in effect since Springwich's first tariff became effective. While Springwich sought and received DPUC authorization to bill in less than one-minute increments, it was not required to utilize that option.

Many allegations of discriminatory conduct made by the resellers were not accepted by the DPUC. Examples include unsubstantiated claims that the retail affiliates of the carriers receive advance notice of all wholesale pricing or promotional plans, that Springwich's retail affiliate contacted independent resellers to encourage higher prices for end-users, that there was "upside-down pricing" by the affiliated resellers where certain retail services were supposedly priced below wholesale cost, that Springwich charged interest in violation of its tariffs, that resellers have been unfairly billed for overlapping calls, that the carriers have improperly refused to provide credits for dropped calls, and even that Springwich's retail affiliate receives special advertising preference in SNET's Yellow Pages. Decision at 23-26. And, even where the DPUC apparently lent some credence to claims of the resellers, it simply indicated that sufficient evidence had been brought forth to warrant a further investigation, and did not go so far as to make any actual findings of discriminatory or anti-competitive behavior. Decision at 26-28, Findings of Fact Nos. 22-25.

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[4]See Springwich Tariff, Part 1, Sheet 10, Section B.1.c; Springwich Tariff, effective rate schedule at p.1.

(viii) Information regarding customer satisfaction or dissatisfaction with services offered by commercial mobile radio service providers, including statistics and other information about complaints filed with the state regulatory commission.

The Decision states that "the record is devoid of any comments or information concerning customer satisfaction with services offered by CMRS providers." Decision at 29. It attempts to rely on Mr. Escobar's testimony about alleged coercive tactics of Springwich to explain why the DPUC has not received any written complaints about provision of bulk wholesale cellular service. Id. The DPUC attempts to use testimony from the two reseller representatives participating in this proceeding as to pricing, service credits "and the lack of interstate equal access" to show customer dissatisfaction, and it attaches the entire testimony of Mr. Escobar to the Decision as an indication that the wholesale carriers represent "an industry with a sufficient level of customer dissatisfaction that should be addressed prior to deregulating the Connecticut CMRS industry." Id. As with so many other areas in the Decision, the DPUC makes no specific findings, the DPUC indicates that this is yet another subject for further investigation. Id.

Here, the Decision overstates its case and draws the wrong conclusion by finding that the record is devoid of comments or information concerning customer dissatisfaction. First, no cellular end user has ever complained in this or any other proceeding before the DPUC. The DPUC has a Consumer Assistance Division with an 800 number that accepts complaints from members of the public about utility services, and it has no record of any complaints from cellular end-use customers. (See BAM Interrog. Resp. TE-15.) The OCC also accepts consumer complaints, and, despite OCC's extensive participation in the DPUC's hearings, it apparently received no such complaints because it disclosed none during the proceeding.

Also, as noted above, fewer than half of the independent resellers participated in this docket, and only two (Connecticut Telephone and Escotel) participated actively. The resellers did not, until 1993 in DPUC Docket No. 90-08-03, bring any of the alleged non-competitive behavior of the carriers to the DPUC's attention for regulatory remediation, nor did any other parties such as OCC or the Attorney General. (Tr. 833-34.) Indeed, as in the case with end-users, the DPUC's Consumer Assistance Division also has no record of any complaints on file from any resellers. (Id.) Given that this particular FCC evidentiary criterion specifically requests "statistics and other information regarding complaints filed with the state regulatory commission", the Decision simply should have admitted that the record shows there are no such complaints, rather than stating obliquely that the record is "devoid of any comments or information concerning customer satisfaction".

Of course, the record is also devoid of any information concerning customer dissatisfaction with services offered by any other CMRS providers. The DPUC chose not to investigate those issues, and rather focused entirely on the complaints of the independent resellers, who were primarily seeking to expand their margins by lowering their bulk wholesale costs. Finally, the Decision also fails to mention the explosive growth in the number of cellular end-use customers and the increase in the number of resellers that has occurred since service commenced in Connecticut in the mid-1980s. As Dr. Hausman testified (Tr. 601), such growth is positive evidence of customer satisfaction, as well as being an important indicator of competition.

APPENDIX B

<u>Statement of Professor Jerry A. Hausman</u>

1. My name is Jerry A. Hausman. I am the MacDonald Professor of Economics at the Massachusetts Institute of Technology in Cambridge, Massachusetts, 02139.

2. I received an A.B. degree from Brown University and a B.Phil. and D. Phil. (Ph.D.) in Economics from Oxford University where I was a Marshall Scholar. My academic and research specialties are econometrics, the use of statistical models and techniques on economic data, and microeconomics, the study of consumer behavior and the behavior of firms. I teach a course in "Competition in Telecommunications" to graduate students in economics and business at MIT each year. Mobile telecommunications, including competitive and technological developments in cellular, ESMR, satellite, and PCS, are some of the primary topics covered in the course. I was a member of the editorial board of the Rand (formerly the Bell) Journal of Economics for the past 13 years. The Rand Journal is the leading economics journal of applied microeconomics and regulation. In December 1985, I received the John Bates Clark Award of the American Economic Association for the most "significant contributions to economics" by an economist under forty years of age. I have received numerous other academic and economic society awards. My curriculum vitae is attached.

3. I have done significant amounts of research in the telecommunications industry. My first experience in this area was in 1969 when I studied the Alaskan telephone system for the Army Corps of Engineers. Since that time, I have studied the demand for local measured service, the demand for intrastate toll service, consumer demands for new types of telecommunications

technologies, marginal costs of local service, costs and benefits of different types of local services, including the effect of higher access fees on consumer welfare, demand and prices in the cellular telephone industry, and consumer demands for new types of pricing options for long distance service. I have also studied the effects of new entry on competition in paging markets, telecommunications equipment markets, exchange access markets, and interexchange markets and have published a number of papers in academic journals about telecommunications. Lastly, I have also edited two recent books, Future Competition in Telecommunications (Harvard Business School Press, 1989) and Globalization, Technology, and Competition in Telecommunications (Harvard Business School Press, 1993).

4. I have been involved in the cellular industry since 1984. I participated in PacTel's purchase of Communications Industries in 1985 and have provided testimony on previous occasions on cellular competition and regulation to the California PUC, the North Carolina PSC, and the Connecticut PUC. I also previously submitted testimony to the FCC on questions of cellular regulation, including the question of whether cellular companies should be allowed to bundle cellular CPE with cellular service and whether the FCC should forbear from regulation of mobile service providers. During the PCS proceedings I have filed 6 affidavits which considered eligibility questions for LECs, the presence of economies of scale and scope in providing PCS, the design of an appropriate auction framework for PCS spectrum, spectrum allocation and band size, eligibility for in-region cellular companies, and the appropriate economic framework for pioneer preferences. I spoke at the FCC Task Force meeting on PCS held on April 11, 1994. I also have done significant academic research in mobile telecommunications and it is one of the primary topics in my graduate course, "Competition in Telecommunications", which I teach each year at MIT.

5. I have been asked by Bell Atlantic Mobile (BAM) to consider the filing by the Connecticut Department of Public Utility Control (CDPUC). I was a participant during the Connecticut proceedings and I presented economic evidence primarily on behalf of BAM and to a lesser extent on behalf of the Block B cellular carrier, Springwich. I will limit my comments to two subjects: calculated rates of return for the two major cellular companies in Connecticut and the use of the Hirschman-Herfindahl index (HHI) by the CDPUC.[1]

6. At the hearing substantial data was presented on the rates of return earned by BAM and Springwich. These data demonstrate that neither cellular carrier is earning a rate of return above what would be expected in a competitive market with the amount of risk inherent in cellular markets. In fact, both the BAM and Springwich rates of return are <u>below</u> the rates of return that the FCC uses to regulate LECs, which have considerably less risk than cellular carriers.

7. The use of HHIs by the CDPUC is contrary to good economic analysis. Rather than doing a forward looking analysis to understand the likely competitive evolution of mobile telecommunications, the CDPUC used a backward looking analysis which ignores ongoing competitive events in Connecticut today and in the near future. I discuss a more correct method to attempt to use the HHIs to evaluate future competition in mobile services in Connecticut.

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[1] The other provider of cellular service, Litchfield, which operates in a single RSA, did not provide rate of return information to the CDPUC.

I. ESTIMATED REGULATORY RATES OF RETURN

8. Regulatory commissions have used regulatory rates of return for many years, despite difficulties in using accounting data to meaure economic returns to a company. To the extent that regulatory rates of return for cellular companies are not significantly above regulatory rates of return for LECs, after adjusting for differences in risk, the conclusion of "just and reasonable" prices can be inferred from the data. However, the risk of cellular telephone is considerably greater than the risk for telephone companies, either LECs or IXCs.

9. The most widely used measure of risk in financial economics is the value of "beta". Beta is derived from the Capital Asset Pricing Model (CAPM) and referred to as "the standard risk measure for individual securities."[2] (Prof. W.F. Sharpe was awarded the Nobel Prize in Economics for his development of beta and of the CAPM.) The beta of a company measures how sensitive its stock price is to underlying market movements where a beta equal to 1.0 is the average risk for a company. Value Line, an investment advisory service, estimates beta. For LECs and IXCs the estimated betas are less than 1.0. For instance, Value Line estimates the betas for SNET, Southwestern Bell, and AT&T all to be equal to 0.95. Using more refined statistical techniques, I estimate the beta of SNET to be 0.69, Southwestern Bell to be 0.70, and AT&T to be 0.88 which seems closer to the actual situation where significant parts of AT&T, e.g. Network Systems which sells equipment, are riskier that LECs. Very few stand alone cellular companies exist so reported beta are scarce. However, Value Line reports the beta for the largest cellular company, McCaw to be 1.85. I estimate McCaw's beta to be 2.11, using

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[2] R. A. Brealey and S.C. Myers, Principles of Corporate Finance, (McGraw Hill, 4th Edition, 1991), p. 129.

more sophistcated econometric methods.[3] Thus, using either Value Line's estimate, or my estimate, McCaw and Metro Mobile before its merger with BAM is at least twice as risky as LECs and IXCs.

10. In each of the last 3 years the estimated regulatory rate of return was significantly less than 15% which even the resellers' expert witness, Mr. Charles King, stated was a reasonable rate of return for cellular carriers. Indeed, the actual rates of return are below the rates of return that the FCC uses to regulate LECs, which are considerably less risky than cellular carriers, as I explained above. Likewise, the estimate and projections for 1994-1996 again demonstrate that no above-competitive returns are expected to be earned by Springwich.

11. Mr King, the resellers' witness, attempted to manipulate these estimates. For instance, he reduced the actual income taxes paid and he excluded construction work in progress from invested capital without providing any offset for funds used during construction. However, these "adjustments" would still leave Springwich's estimated rate of return below 15%. So he then (Exhibit 41) substituted BAM's lower operating expenses for Springwich's actual operating expenses in his calculations. This substitution has no basis in economics (or regulatory accounting) and should be disregarded in any reasoned analysis. BAM is able to take advantage of economies of scale in equipment purchases and billing and other computer systems because of its significantly larger size than Springwich (51.3 million POPs for BAM versus 3.9 million POPs for Springwich). Since BAM is over 13 times larger than Springwich, I would expect BAM to have lower costs. But (almost) all economist agree that prices are set at the margin, and Springwich certainly has to use its own costs as the basis of setting its market price.

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[3] I estimated the beta of Metro Mobile which operated the Block A cellular system in Connecticut, before its merger with BAM, to be 1.8.

12. I also calculated post-tax rate of returns for BAM in Connecticut. BAM's actual post-tax rate of return using its actual financial statements is also less than 15% which the resellers' expert stated was an appropriate rate of return for cellular carriers.[4] My calculations do not include the purchase price paid by BAM in its purchase of Metro Mobile.

13. Analysis of rates of return of the two primary cellular carriers in Connecticut demonstrates conclusively that they are not earning above competitive rates of return.[5] Indeed, their post tax rates of return are in the range (or even below) of the rates of return used by the FCC for LECs. However, financial data demonstrates that LECs are considerably less risky than cellular companies. Thus, competitive rates of return for cellular carriers should be significantly greater than for LECs. Thus, the Connecticut data do not demonstrate that cellular prices are too high in Connecticut.

II. Use of HHI's to Determine Competition in Cellular Markets

14. The CDPUC relied on the Herfindahl-Hirschman Index (HHI) to partly base its judgment on the need for continued regulation. Since the CDPUC considered only cellular without considering SMR and other CMRS, it determined that the cellular market was highly concentrated according to the Merger Guidelines (MG), i.e. the HHI was above 1800. This calculation basically demonstrates the obvious--that with a duopoly for cellular carriers the HHI will be around 5000.

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[4] Again, Mr. King made various "adjustments" to the calculated rate of return in terms of taxes paid by Bell Atlantic, construction work in progress, and estimates of future revenues. My calculations are based on Bell Atlantic Mobile's actual financial statements.

[5] The other cellular carrier is the Block A carrier in the Litchfield RSA. I understand the company has made losses in each year of its operations.

15. However, the HHI states nothing, looked at by itself, about the amount of competition. The MG recognize the limited value of the HHI: "However, market share and concentration data provide only the starting point for analyzing the competitive impact of a merger". (1992 Merger Guidelines, para. 2.0). All economists agree that competitive analysis must be forward looking, and additional competition for cellular has begun to take place in Connecticut.

16. Competition is increasing significantly in mobile communications with the operation of Nextel's ESMR networks.[6] ESMR, or Enhanced Specialized Mobile Radio, offers a digital mobile telecommunications service which competes directly with cellular service. Nextel began operation in Los Angeles in 1993 and plans to begin operation in San Francisco and New York in 1994: "Nextel expects to activate the Digital Mobile networks in San Diego,..., the New York tri-state area, Chicago and Milwaukee sometime later in calendar year 1994...." (Nextel Prospectus, Feb. 11, 1994, p. 4) Nextel has now expanded its plans, and has purchased sufficient ESMR spectrum from Motorola and other companies to be able to offer its services to about 70% of the population in the U.S.[7] Nextel's proposed service areas cover about 200 million people and 47 of the top 50 U.S. SMSAs. In Connecticut, Nextel is currently developing its network and has approval for over 20 tower site locations. Nextel expects to begin operation in Connecticut in the beginning of 1995.

17. The recent FCC decision to allocate 120 MHz of spectrum for the construction of Personal Communications Service (PCS) networks will also lead to significant new entry by CMRS providers. Interest is very high among

[6] Cellular prices decreased in Los Angeles by 17-20% when Nextel began operation.

[7] McCaw, the largest cellular carrier, has service areas which cover about 25% of the U.S. population.

potential PCS providers which include local telephone companies (both in and outside their regions), interexchange carriers, local cable TV companies, cellular companies, and many other companies. The recently completed narrowband PCS auction demonstrates the high degree of interest in the provision of new services. PCS broadband auctions are likely to begin by the end of 1994. PCS will begin to provide significant new competition to cellular beginning in 1995 or 1996. A minimum of 3 new 30 MHz band PCS providers will offer service in each geographical area, plus one or more other new providers in the 10 MHz bands.

18. PCS already works. In December 1993 when I visited the United Kingdom (UK), I used the PCS network which has been constructed by Mercury in partnership with U.S. West. The second PCS network in the UK, the Orange network operated by Hutchison Telecom, began operation in April 1994. The Orange network already covers 50% of the UK population, and it plans to cover 70% by the end of 1994, and 90% by the end of 1995. Both the Mercury and Orange networks have been successful almost from their inception--about 25% of new mobile activations in the UK in the latest quarter have been on these new networks.

19. The CDPUC recognized that ESMR and PCS would soon begin operation, but it misunderstood the competitive impact of new entry. It attempted to recalculate HHI's taking into account projections of ESMR and PCS CMRS share in the future. However, it made a fundamental economic mistake in failing to recognize that competition takes place at the margin. It is the competition for new customers (absent price discrimination) that sets prices in a market so that looking at overall market shares when new entry has occurred is incorrect. Looking at overall market shares gives a downward biased estimate of the competitive significance of new entry. An example demonstrates this principle. For airline flights between Washington/Baltimore and Cleveland, customers, until recently, could choose either US Air or Continental.

Southwest Airlines then decided to enter the market. Initially, Southwest had a much smaller share than the other two airlines, but nevertheless airline fares fell rapidly (by over 1/2) on this route. Southwest's entry had a large effect despite its small share. An HHI based on customers share obviously leads to the incorrect conclusion on competition.

20. The economic factors which determine the competitive effect of a new entrant are whether new customers will find the new entrant's service acceptable (demand elasticity) and whether the new entrant can supply sufficient capacity to compete for a significant proportion of the new customers (supply elasticity). Market evidence from the UK demonstrates that demand acceptance already exists for PCS and both Nextel and PCS providers will have more than enough supply capacity to serve all new customers given their digital networks which have 3-6 times the capacity of current cellular networks. Thus, the CDPUC use of HHI's is an incorrect approach to determine the likely future competitive effects of Nextel and PCS in Connecticut. If one uses a supply based HHI where spectrum capacity is used, the HHI with cellular, ESMR, and PCS is 1195 which is toward the very low end of the moderately concentrated range (1000-1800). Thus, the usefulness of an HHI is limited for CMRS because of the rapidly changing technology and new entry, but an appropriate HHI demonstrates that the new entrants from ESMR and PCS will have more than sufficient capacity to create sufficient competition so that regulation is unnecessary.

J. A. Hausman 14 Sept. 1994

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May 1994

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Associate Editor, Journal of Public Economics, 1982-
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Director, MIT Telecommunications Economics Research Program, 1988-
Board of Directors, Theseus Institute, France Telecom University, 1988-
Member, Conference on Income and Wealth, National Bureau of Economic Research, 1992-

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